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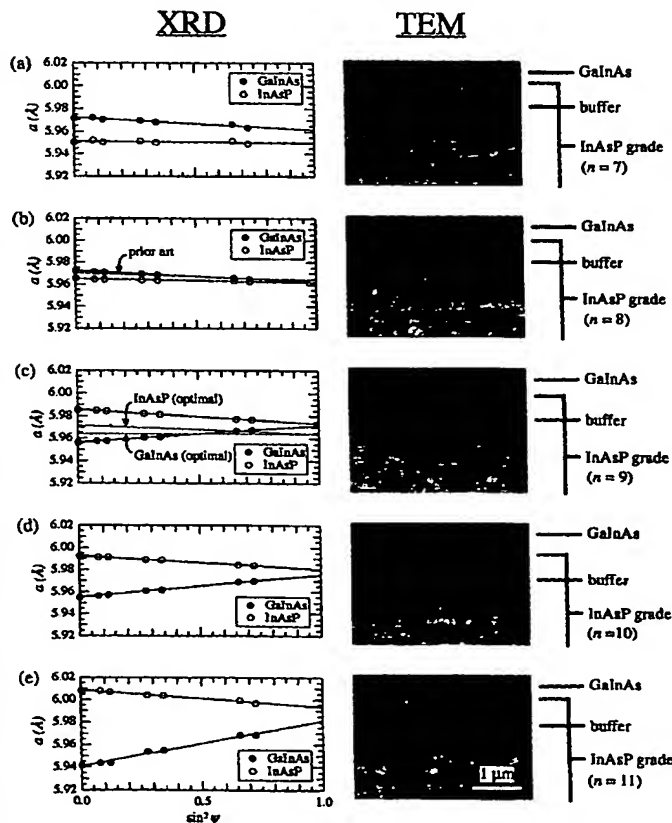
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- (71) Applicant (*for all designated States except US*): MIDWEST RESEARCH INSTITUTE [US/US]; 425 Volker Boulevard, Kansas City, MO 64110 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): WANLASS, Mark, W. [US/US]; 2104 Douglas Mountain Road, Golden, CO 80403 (US). AHRENKIEL, S., Phillip [US/US]; 4901 Garrison Street, Apt. 200, Wheatridge, CO 80033 (US).

[Continued on next page]

(54) Title: METHOD FOR ACHIEVING DEVICE-QUALITY, LATTICE-MISMATCHED, HETEROEPI TAXIAL ACTIVE LAYERS



(57) Abstract: A method is provided for achieving device-quality active layers in lattice-mismatched-heteroepitaxial systems. The method eliminates strain and dislocations resulting from lattice mismatch with respect to the substrate (12) of a heteroepitaxial active layer (14). The optimized heterostructure comprises a substrate (12), a compositionally step-graded region terminated with a buffer layer (14), an intermediate region (16), an active layer (18), and a capping layer (20). Concepts of the invention are demonstrated in double heterostructures containing the semiconductor alloys $Ga_xIn_{1-x}As$ and $InAs_yP_{1-y}$.

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**Declarations under Rule 4.17:**

- as to the identity of the inventor (Rule 4.17(i)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ,

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INTERNATIONAL SEARCH REPORT

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PCT/US02/28314

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C30B 25/02; 25/04

US CL : 117/84,

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 117/84,

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
STN (hcaplus, japio, inspec, uspatall)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KAE-NUNE, et al. Strain Relaxation of Ga _{0.2} In _{0.8} As and InAs _{0.5} P _{0.5} Layers Grown On InP Substrate For 1.6 to 2.4 .mu.m spectral range GaIn _{1-x} As/InAsyP _{10y} /InP Photodiodes Application; Conf. Proc. - Int. Conf. Indium Phosphide Relat. Mater., 5th (1993), pages 135-138 (Abstract Only)	1-49

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Box PCT
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Facsimile No. (703)305-3230

Authorized officer

Felisa Hiteshew

Telephone No. (703) 308-0661